LITERATURE CITED

Franzen, Dorothea S. 1971. Anatomy and Geographic Distribution of the Succineid Gastropod, *Succinea vaginacontorta* Lee. *The Nautilus* **84**(4):131–142, Tables I, II, Figs. 1-3.

Hubricht, Leslie. 1958. *Quickella vermeta* and *Succinea indiana*. *The Nautilus* **72**(2):60–61.

_____ 1961. Eight New Species of Land Snails From the Southern United States. *The Nautilus* **75**(1,2):26–32, 60–63, Pl. 4, figs. 1, 2.

_____ 1985. The Distribution of the Native Land Mollusks of the Eastern United States. *Fieldiana, Zoology*, New Series, No. 24, Publication 1359, Field Museum, I-191; Maps 523.

Lee, C. Bruce. 1951. *Succinea vaginacontorta* (Section Calcisuccinea), A New Amber Snail from Kansas. *Occ. Pap. Mus. Zool., Univ. Mich.*, No. 533 (Mar. 20): 1-7, Pls. I, II, Text fig. 1.

Leonard, A. Byron. 1959. Handbook of Gastropods in Kansas. *Univ. Kans. Mus. Nat. Hist. Misc. Pub.* No. 20 (Nov. 2): 1-224, Pls. 1-11, Figs. 1-87.

Miles, Charles D. 1958. The Family Succineidae (Gastropods: Pulmonata) in Kansas. *Univ. Kans. Sci. Bull.* 38, Pt. 2, No. 24 (Mar. 20): 1499-1543, Pl. 1, Figs. 1-8.

Pilsbry, Henry A. 1948. Land Mollusca of North America (North of Mexico). *Acad. Nat. Sci. Philadelphia Mon. No. 3*, Pt. 2: xlvii & 521-1113, 585 figs.

Yearbook of Agriculture. 1941. *Climate and Man*. United States Department of Agriculture, U.S. Government Printing Office, Washington, D.C.: v-xii and 1-1248.

A NEW SPECIES OF *CORALLIOPHILA* (GASTROPODA: CORALLIOPHILIDAE) FROM SOUTHEASTERN POLYNESIA

Harald A. Rehder
Smithsonian Institution
Washington, DC 20560

ABSTRACT

Coralliophila latilirata *is described as new from southeastern Polynesia and compared with* C. bulbiformis *Conrad (1837).*

The receipt from M. Jean Trondle of La Force, France, of numerous specimens of a species of *Coralliophila* from the shores of Anaa Atoll in the Tuamotus, called my attention forcefully to the distinctness of a species which I had collected earlier in French Polynesia, Pitcairn, and Cook Islands, but only in single lots or as fragments. A careful comparison of material of this species with that of *C. bulbiformis* Conrad (1837) has revealed not only its distinctness, but also that it is found only in a rather limited area.

Coralliophila latilirata, *new species*

Figs. 1-3

Diagnosis: Shell of moderate size, 15-30.75 mm in length, globose to broadly ovate, with numerous crowded, broad, scabrous, flattened spiral cords; aperture deep lavender to pale purple, occasionally white. It is close to *bulbiformis* Conrad, (1837) but is more inflated, with a lower spire, and broad, crowded, flattened, spiral cords.

Range: Southern Cooks, western Austral Islands, Society Islands, Tuamotus, and Pitcairn Group (Fig. 4).

Description: Shell stout, thick-shelled, globose to broadly ovate, white, adults from 15 to 30.75 mm in height, width from 70% to 92% of height. Protoconch polygyrate, conical, pinkish, about 4¾ whorls; first whorl apparently smooth (partially-broken off), following whorls with a nodulose spiral keel below a sloping shoulder with axial riblets which are somewhat prosocline to opisthocyrt[1]; a second keel gradually forms above the main keel resulting in the last 1 1/5 protoconch whorls bearing two keels made nodulose by the axial riblets. Postnuclear whorls about 6 (earliest whorls generally worn or covered with calcareous deposit), early ones

[1]"somewhat inclined forward to curved backwards" – Editor.

FIGS. 1-3. *Coralliophila latilirata* n. sp. **1** and **2** apertural and top views of the holotype, USNM 731531, height 25.22 m. **3**, apertural view of paratype, USNM 845460, height 30.78 mm.

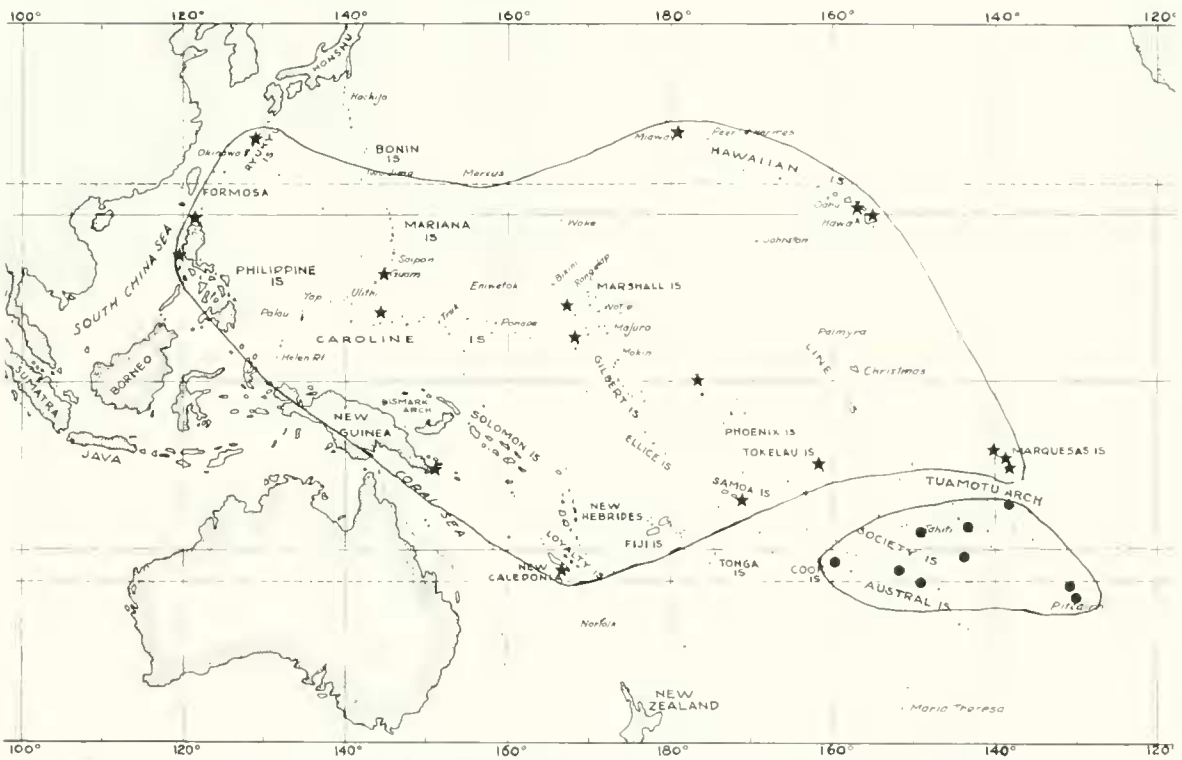

FIG. 4. Map showing distribution of *Coralliophila latilirata* n. sp. (circles), and *Coralliophila bulbiformis* Conrad (stars).

strongly carinate, with four broad lirae, finely scalloped, separated by narrow grooves and crossed by broad rounded axial ridges, rendering the surface of the whorls wavy; in later whorls the axial ridges become broader and lower, and the spiral ridges more irregularly nodose, or flattened, the separating grooves usually very narrow; the penultimate whorl generally with five spiral ridges; body whorl evenly convex, with about 17 irregularly flattened ribs that are axially and densely lamellate; the lamellae generally fused together especially on the prosocyrt axial ridges that number thirteen on the body whorl of the holotype, but may be fewer and broader on other specimens; in worn specimens the axial lamellae that compose

the broad spiral lirae may be more or less obscure due to fusion and some erosion. Aperture oval, ending anteriorly in a short to moderately long, curved, narrowly attenuated canal; outer lip made finely crenulate by the ends of the external spiral ridges; columella and interior of aperture deep-to pale-lavender, (light grayish purplish red to grayish purplish red: Kelly & Judd, 1965); a strong lamellose fasciole, surrounding a broad to moderately narrow false umbilicus, terminates in the end of the siphonal canal.

Habitat: Host unknown. Found alive under and near coral in 40-55 ft. and dredged in 50-56 fathoms. Found in stomachs of fish (*Coris aygula*) caught in 50-100 ft.

Type Locality: Oeno, Pitcairn Islands.

Material: Holotype: lagoon, northshore, in 1-6 ft. on hard pan bottom, Oeno, Pitcairn Islands, collected by H. A. Rehder, 18 December 1970 (USNM 731531). Paratypes–COOK ISLANDS: W. of Avatiu, Rarotonga in 45 m (USNM 732270); E of Avarua, Rarotonga, in 25 m (USNM 732262); AUSTRAL ISLANDS: NW of Moerai, Rurutu, in 40-50 m (USNM 732217); north coast, Tubuai, 25 m (USNM 732294); SOCIETY ISLANDS: E side Taunoa Pass, Arue, Tahiti (USNM 668779); TUAMOTUS: NW side Puka Puka (USNM 789879); NW end of lagoon, Anuanuraro (USNM 725347); dead on beach, Anaa (USNM 845460; Colln. Trondle); dead on beach, Raroia (USNM 697956, 697685, 698743). PITCAIRN ISLANDS: off NW corner, in 100-124 m Pitcairn (USNM 789442); off Bounty Bay in 15-16.7 m Pitcairn (USNM 731663); W of Bounty Bay, in 30 m (USNM 731831); off Christian's Point, in 15 m (USNM 731765).

The two lots from the Cook Islands, the lot from Rurutu, and two of the lots from Pitcairn (USNM 731831, USNM 731765) all consist of fragments found in the gut of specimens of the fish, *Coris aygula*, speared at the depths indicated.

Measurements (mm):

	height	width
USNM 731531 holotype	25.22	20.18
Trondle Colln. paratype	30.75	25.05
USNM 731663 paratype	21.83	20.26
Trondle Colln. paratype	19.18	16.85
Trondle 789453 paratype	18.08	14.64
Trondle 725347 paratype	16.32	14.34
USNM 789879 paratype	15.05	13.05

Twenty-five specimens were measured and found to range between 30.75 to 15.05 mm in height and 25.05 to 13.05 mm in width; the average height is 21.72 mm and the average width is 18.14 mm.

Etymology: From the Latin, meaning "with broad ridges."

Discussion: This species is closest to *Coralliophila bulbiformis* Conrad, 1837, but is less elevated, with a low broad spire with flattened whorls, the spiral lirae less numerous, broader, flattened, and made nodulose by more or less worn lamellae, and the axial ribs lower, less prominent than in most specimens of *bulbiformis*.

Good illustrations of *C. bulbiformis* Conrad may be found in Cernohorsky 1978 (pl. 21, fig. 4) and Kira, 1962 (p. 68, pl. 26, fig. 6). *C. bulbiformis* is identified as *C. costularis* Lamarck, 1816, by Salvat and Rives, 1975 (p. 310, fig. 190), but the latter is a narrower, fusiform species that is found from East Africa to the Ryukyus. Similarly, *C. bulbiformis* is synonymized by Kay in her Hawaiian Marine Shells (Kay, 1979, p. 255, pl. 90B) under *C. erosa* (Röding), but an examination of the description and figures in Chemnitz on which Röding based his name shows that *erosa* is the species that Kay describes and figures (Kay, 1979, p. 255, fig. 90A) under *C. dorbignyana* (Petit, 1851), a junior synonym of *erosa*.

Coralliophila bulbiformis Conrad varies considerably in shape, from rather elevated with strongly convex, more or less angled whorls with consequently indented sutures to ovate species with only slightly convex whorls and less indented whorls. The latter form is common in the Hawaiian Islands, while the Marquesan specimens are more elevated with convex whorls, as are most of those in the rest of the range of the species. It is a distinct species, and not a subspecies of *C. erosa*, as Abbott and Dance (1982, p. 155) cite it.

This new species is restricted, as far as we now know, to the Cook Islands and French Polynesia, including the Pitcairn Islands (Fig. 4). It has however not been found in the Marquesas, where *C. bulbiformis* occurs, or in Rapa. *C. bulbiformis* is found from the Ryukyus and Philippines eastward to Hawaii, the Marquesas Islands, Samoa and New Caledonia.

LITERATURE CITED

Abbott, R. Tucker and S. Peter Dance. 1982. *Compendium of Seashells.* New York, 410 pp.

Cernohorsky, Walter O. 1978. *Tropical Pacific Marine Shells.* Sydney: New York, 352 pp.

Conrad, T. A. 1937. Descriptions of new marine shells from upper California, collected by Thomas Nuttall, Esq. *J. Acad. nat. Sci. Philadelphia* **7**:227-268, pl. 17-20.

Kay, E. Alison. 1979. *Hawaiian Marine Shells.* B. P. Bishop Museum Spec. Publ. **64**(4), 671 pp.

Kelley, K. L. and D. B. Judd. 1965. The ISCC-NBS Method of Designating Colors and a Dictionary of Color Names. *Nat. Bur. Standards Circular* 553, 163 pp.

Kira, T. 1962. *Shells of the Western Pacific in Color.* Osaka, 224 pp.

Salvat, Bernard and Claude Rives. 1975. *Coquillages de Polynesie.* Papeete, 391 pp.

NATIVE FRESHWATER MUSSELS (UNIONACEA) AS FOULING AGENTS IN ELECTRICAL GENERATING PLANTS

Raymond W. Neck
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, TX 78744

ABSTRACT

The occurrence of native freshwater mussels (Unionacea) as fouling agents in the water supply system of an electrical-generating plant is reported. Details of the reported problem and discussion of the likelihood of similar occurrences in additional generating plants are presented.

While the Asiatic clam, *Corbicula fluminea*, is well-known as a fouling agent in electrical generating plants (Mattice, 1977; Smithson, 1981), native unionids have not been implicated in similar situations. Absence of unionids in water distribution systems has been attributed to lack of byssus attachment (see Ingram 1953). Herein I record an example of both *Corbicula* and native unionids as fouling agents in a cooling water supply main for a lignite-fired electrical generating plant. The purposes of this study were (1) to understand factors significant in this fouling example and (2) to determine if this was an isolated incident or a forerunner of future problems at other power plants.

Alcoa Lake is a 5972-hectare reservoir located 11 km southwest of Rockdale, Milam Co., Texas. The impoundment was created in 1953 on Sandy Creek, a tributary of East Yegua Creek in the Brazos River drainage. The limited surface runoff water is supplemented by an aqueduct which transports water approximately 20.5 kilometers from the Little River, also in the Brazos drainage. The unionids reported below probably originated from the Little River, although some stocking of fish has occurred in Alcoa Lake.

Jule Frankeny of International Generating Corporation, operator of the Sandow Power Plant at Alcoa Lake, informed me that a number of clams had been forced under pressure in August 1983 from a service line (off the supply main) which had been partially blocked. Inspection of recovered clams revealed *Anodonta grandis, Cyrtonaias berlandieri* and *Corbicula fluminea;* all three species have been reported from the Brazos drainage (Strecker 1931; Fontanier 1982). These clams were recovered from a 14-inch diameter pipe located four feet below ground surface. To reach this pipe, the individuals recovered had passed through an initial traveling screen (12.8 mm mesh), large pump, booster pump (19.5 mm bore), and another strainer (4.8 mm mesh).

Two water supply mains transport water from Alcoa Lake to the Sandow plants. Both mains are of equal size (initially 78" diameter), but one main supplies two plants while the second only supplies one plant (a planned fourth plant was